Spherical Primary Optical Telescope Testbed (SPOT)

Completed Technology Project (2011 - 2013)

Project Introduction

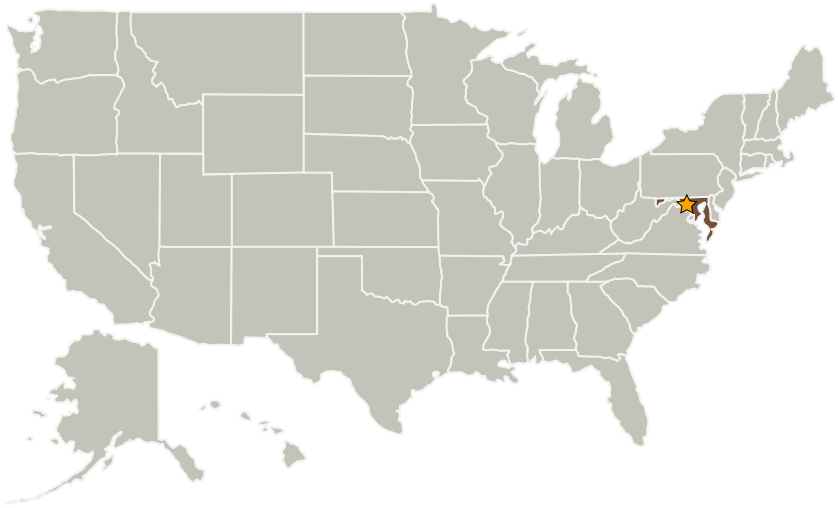
This IRAD proposes to continue operation of the Spherical Primary Optical Telescope (SPOT) testbed as an image-based wavefront sensing demonstrator. In addition to completing phasing experiments of the SPOT segments, advanced wavefront sensing techniques such as geometrical optics phase retrieval and transverse-translation diversity will be applied to the testbed. A thorough modeling and simulation study of phase retrieval on the as-built SPOT system will also be completed.

The SPOT test bed consists of three one-meter-class segments on tip/tilt and piston actuators. The purpose of the test bed is to demonstrate wavefront sensing and control technologies for large segmented telescope architectures, without requiring separate dispersive elements or periodic rephasing. The SPOT architecture utilizes a point source at the radius of curvature of the mirrors and performs image-based wavefront sensing (WFS), also known as phase retrieval.

Anticipated Benefits

N/A

Primary U.S. Work Locations and Key Partners



Spherical Primary Optical Telescope Testbed

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations
Maryland

Project Management

Program Manager:

Peter M Hughes

Project Manager:

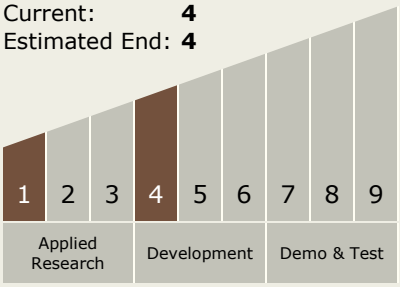
Terence A Doiron

Principal Investigator:

Matthew R Bolcar

Technology Maturity (TRL)

Start: **1**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.2 Observatories
    - TX08.2.1 Mirror Systems